



Forest Processes

3rd - 4th Grade Field Trip

Preparing For Your Trip





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Forest Processes 3rd-4th Grade Field Trip

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Welcome and Need to Know Information

Dear Teacher,

This packet contains all the information you will need to prepare your students for a “Forest Processes” field trip to Glacier National Park.

- The field trip lesson plan on pages 10-16 should answer most questions about field trip logistics, objectives, and schedules.
- The rest of the lessons are meant to prepare students for the concepts and vocabulary highlighted on the field trip. Each activity can serve as a pre-visit introduction or a post-visit assessment/extension. A suggested unit plan organization is located on the following page.
- Glacier’s [SmartBoard lessons](#) are a great way to supplement this unit.
- Visit our [website](#) for more lesson plan ideas and background information for any field trip. This guide contains only a sample of what is available.

Be sure to confirm the date(s) and meeting place for your field trip (received via email are correct). There is no cost for this field trip. A waiver for the park entrance fee has been processed for your class(es). [Travel grants](#) from the Glacier National Park Conservancy may be available to schools with restricted travel budgets.

The education ranger assigned to your group will call you before your field trip date to discuss the schedule and answer any questions. You can also reach them at 406-888-7899.

Our education programs are made possible by the support of the Glacier National Park Conservancy. Thank you for introducing your students to the National Park Service mission and the wonders of Glacier!

Glacier National Park
Education Staff



Glacier National Park
CONSERVANCY

Glacier’s Education Goals

- Provide opportunities for the students to form emotional and intellectual connections with park resources and values.
- Introduce students to the National Park Service mission and significances of Glacier.
- Provide curriculum-based, outdoor education experiences that are age appropriate and supplement classroom learning objectives.
- Introduce students to the value of protecting natural and cultural resources for current and future generations and to encourage actions we can all take to be good stewards of this special place.



Suggested 5-Day Lesson Sequence with Field Trip

	Summary	Objectives Students will understand:	MT and Next Generation Science Standards	Materials
Pre-Field Trip Lesson 1 <i>Mature Forest Mime</i>	Students pantomime a variety of words related to a mature forest.	<ul style="list-style-type: none"> Ecological concepts related to a forest, through use of a pantomime. 	MT.SCI.K-12.3 Demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment. 2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.	<ul style="list-style-type: none"> Vocabulary list with definitions Vocabulary words printed Container
Pre-Field Trip Lesson 2 <i>Old Growth Forest Mural</i>	Students create a mural of an old growth forest. This may take more than one class period.	<ul style="list-style-type: none"> Identify the four components of an old growth forest. Apply understanding of the forest community and its residents. 	MT.SCI.K-12.3 Demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment. 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	<ul style="list-style-type: none"> Butcher paper for mural Construction paper for cut-outs Crayons, paint, scissors, glue.
Field Trip Day <i>Forest Processes</i>	Students meet the rangers in an old growth forest for a 1-2 mile round trip hike. There will be stops at various points along the trail to do activities or discuss things they see in the forest.	Vary depending on field trip. Talk to the ranger before your visit for more information.	MT.SCI.K-12.3 Demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment. 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	<ul style="list-style-type: none"> Warm clothes Name tag Lunch Adult helpers
Post-Field Trip Lesson 3 <i>Forest Poems</i>	Students share their observations about the forest in a group activity, then go off by themselves and write a poem.	<ul style="list-style-type: none"> How to express their observations and feelings about the forest in a poem. 	MT.SCI.K-12.3 Demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment. 2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.	<ul style="list-style-type: none"> Pencils 5x7 index cards An example of a haiku and cinquain poem



Lesson 1: Pre-Visit

Mature Forest Mime

Materials:

- * Vocabulary list with definitions
- * Small pieces of paper with vocabulary words printed on them
- * Container



Vocabulary

Bacteria, canopy, decomposition, ecosystem, environment, food chain, food web, fungus, habitat, invertebrate, lichen, microorganism, predator, prey, sapling, snag, succession, understory, yeast.

Method

Students pantomime a variety of words related to a mature forest.

Objective

Students will be able to interpret and identify ecological concepts related to a forest, through use of a pantomime.

MT State Science Standard

MT.SCI.K-12.3.3 Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

- A proficient student will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species.

Next Generation Science Standard

2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

Background

A forest is organized in vertical layers. The top layer is the canopy, or roof of the forest community. Here leaves catch the sunlight necessary for trees to create food, release oxygen, and provide shelter and shade in the forest below. Below the canopy are the understory trees; young trees of the canopy species, and smaller, shade tolerant trees that will never become part of the canopy. In the old growth forest the students will be visiting in Glacier National Park, western red cedar forms the canopy, while western hemlock and Rocky Mountain maples form the understory.

Beneath the understory is the shrub layer, where knee-high to head-high woody plants reside. Beneath the shrub layer is the herb layer where ferns, grasses, wildflowers, and smaller woody plants grow. Here bunchberry dogwood, bracken fern and queencup are found, among others.

The forest floor is the bottom layer of mosses, mushrooms, creeping plants

Background, Continued

and forest litter (leaves, needles, twigs, feathers, bark bits, animal droppings, etc.). This is where decomposition occurs and where 95% of all insects live at some point in their life cycle. The final layer is the forest's basement, laced with plant roots, mycelia of fungi (the threads which nourish the mushroom), and tunnels of animals such as the ground squirrel and shrew.

Each layer of the forest has its characteristic animal species, although most feed in more than one level and some nest in one story and feed in another. Every animal and plant consumes a portion of the available nutrients and has its place in the forest community food chain, directly or indirectly affecting all the other organisms. Here are vocabulary words related to mature forest communities.

- **Bacteria:** typically a one-celled microorganism which multiplies by division, has no chlorophyll, and can be seen only with a microscope.
- **Canopy:** the leaf and branch layer of the tallest trees that forms a roof over the forest community.
- **Decomposition:** the break up into simple parts; from a dead tree to soil.
- **Ecosystem:** a community of living things interacting with each other and with the physical environment. Major types of ecosystems include aquatic (pond, creek, lake, ocean) and terrestrial (grassland, forest, desert).
- **Environment:** the surroundings of a plant or animal including other plants and animals, climate, and location.
- **Food Chain:** the transfer of energy from the sun to plants and then to animals. For example: sun to pine tree -to red tree squirrel -to pine marten.
- **Food Web:** the interconnection of the food chains in a community. A food web shows how members of the community are connected to other members by what they eat.
- **Fungus:** a group of plants including mildews, molds, mushrooms, that have no leaves, flowers or chlorophyll, and reproduce by means of spores.
- **Habitat:** the arrangement of food, water, shelter and space suitable to an organism's needs.
- **Invertebrate:** an animal without a backbone: bacteria, insects, spiders.
- **Lichen:** alga and fungus growing together in a symbiotic relationship.
- **Microorganism:** an organism microscopic in size, observable only through a microscope.
- **Predator:** an animal which kills and eats other animals.
- **Prey:** animals that are killed and eaten by other animals.
- **Sapling:** a young tree.
- **Snag:** a standing dead tree from which most of the leaves and branches have fallen.
- **Succession:** the orderly, gradual, and continuous replacement of one plant or animal by another.
- **Understory:** the layer formed by the crowns of smaller trees in a forest
- **Vertebrate:** an animal having a backbone, or spinal column: fish, amphibians, reptiles, birds, and mammals.
- **Yeast:** a mass of minute fungi.

Procedure

1. Discuss layers of the forest community with students. Give them the vocabulary words and definitions. Discuss and encourage students to give examples of definitions.
2. List all the words on small pieces of paper and put them in a container.
3. Divide the class into small groups. Each group draws one word from the container, looks up the definition using the handout, and decides how to pantomime that word. Allow about five minutes for the groups to prepare their mimes.
4. Groups of students then take turns miming their word to the class. Set a time limit of one minute per group.
5. The rest of the class may use the vocabulary list as a guideline for guessing the word being mimed.
6. Groups gain one point for a successful miming (having their word guessed within the one-minute time limit) and one point for guessing another group's mime correctly.
7. Continue drawing words as time permits, changing groups or having "star mimers" assist students who muddled their mimes.

Evaluation

Ask students to choose one of the vocabulary words and draw a picture of its meaning.

Extension

- Go outside for this activity. An outdoor environment is conducive to learning ecological concepts and noise levels are less of a problem.
- Define words together in class orally. List words and definitions on chalkboard. This encourages students to think and remember. Leave definitions on board, or erase, challenging the students and encouraging memory retention.



Lesson 2: Pre-Visit

Old Growth Forest Mural

Materials:

- * Butcher paper for mural
- * Construction paper for cut-outs
- * Crayons, paint, scissors, glue.



Vocabulary

Community, diversity, forest, layers, old growth, saplings, snags.

Method

Students identify the components of an old growth forest and create a class mural.

Objectives

MT State Science Standard

MT.SCI.K-12.3.3 Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

- A proficient student will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species

Next Generation Science Standard

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Background

The purpose of this activity is to allow students the opportunity to examine the unique characteristics of old growth forest communities. Old growth forests are dominated by large trees at least 250 years old, and have all of the following characteristics present at the same time:

1. Large living trees and a multi-layered canopy-the canopy is the leaf and branch layer of tall trees that form a roof over the forest community. In an old growth forest, the larger trees, two hundred feet tall or more, tower over the younger trees. Both grow together in a mixture of species. The uneven canopy is efficient at trapping moisture during the drier seasons. The huge trunks often survive fires, for they are reservoirs holding thousands of gallons of water and are protected by thick bark.
2. Large standing snags - are standing dead trees from which the leaves and most of the branches have fallen. Snags may stay erect for over two hundred years. As their branches fall off, sunlight is able to reach the forest floor, allowing species that require light to take root. Insects and

woodpeckers open up the dead wood, providing habitat for many other species, which in turn become food for larger predators.

3. Woody debris- fallen trees help to hold soil in place, and as they decay over a period of two to five hundred years, many species of insects, birds and mammals use them for food and shelter. This activity helps raise the concentrations of nutrients like phosphorus and nitrogen in the rotting wood, which the rootlets of other plants can tap for food. Like live trees, fallen trees can hold large amounts of water. Fallen trees can also crisscross small head-water streams. The run off is not strong enough to move the downed trees and they become temporary “stairsteps” that hold woody debris long enough for 70 percent of it to be processed by insects and bacteria. Fish consume these insects and rely on the pool-forming ability of the forest for shelter and for temperature control.
4. Any one of the above characteristics may occur in younger forests, but only in old growth forests do all four occur. The old growth forest the students will be visiting is a Western red cedar, Western hemlock forest.

Procedure

1. Discuss a forest community with the students, and the four characteristics of an old growth forest (old trees, woody debris, layers, snags). Divide students into groups to represent each characteristic on a class mural.
2. Have the groups research old growth forests in Montana. What species of trees are found in the state’s old growth forest? Each group will be responsible for portraying their part of the forest and the community of organisms which thrive there. For example, the group assigned to large living trees will want to research the characteristics of the tree species in those forests and place many large living trees on the mural; the layers group will have some tall, old living trees and younger trees and saplings. They will also want to find out what types of animals depend on these trees for food, shelter and nesting, and represent them on the mural.
3. After students have gathered the material they need, they may begin drawing, painting, and making cut-outs for the mural. You may wish to make an outline for the mural to insure that the forest mural is equally distributed with living trees, snags, down trees, and a stream running through the forest, so that there are not clumps of snags, etc.
4. When the mural is completed (and this may take several class periods), ask each group to present and explain their part of the forest and the organisms living there to the rest of the class. Compare and contrast an old forest with a younger forest.

Evaluation

Ask the students, “What is the value of protecting old growth forests in Montana?” Can all of our forests be left to become old growth? Why or why not? How could you find out how much old growth forest is left in the state? “Would it matter if we harvested the trees in what is left of our old growth forests?” “What if a fire went through the old growth forest in Glacier?”

Extension

Create a 3d art project of the parts of a tree using the [Trees: The Inside Story](#) activity. There are [additional activities for learning about old growth forests](#) on the Glacier National Park website.

Research why western redcedar is considered a cultural resource and what its traditional uses by the Salish, Kootenai and Pend d’Oreille are.



Field Trip Day!

Forest Processes



Vocabulary

Carbon cycle, coniferous, consumer, decomposer, dichotomous, forest succession, interrelationships, micro-climate, model, old-growth, phloem, photosynthesis, producer, soil, symbiotic, xylem.

Method

Students meet the rangers in an old growth forest for a 1-2 mile round trip hike. There will be stops at various points along the trail to do activities or discuss things they see in the forest. Additionally, students will examine replicas of traditional native crafts that were constructed using resources from the forest.

Objectives

Students will be able to (depending on grade level and weather conditions):

- Tell what national parks protect and one reason Glacier National Park was established.
- Identify coniferous trees with a dichotomous key.
- Give 3 examples of interrelationships in the forest.
- Point to a place in the forest that would have a different micro-climate than on the trail.
- Define producers, consumers, decomposers and point to an example of each in the forest.
- Model how trees transfer food and water through their xylem and phloem, and how they are adapted for protection from insects, cold weather, and drought.
- Describe the characteristics of an old growth forest.
- Name one symbiotic relationship in the forest.
- Write a recipe for soil.
- List the raw materials needed for photosynthesis as well as the products.
- Explain how trees play a role in the carbon cycle.
- Describe the process of forest succession.
- Find an example along the trail of a living organism depending on something non-living.
- Give an example of a forest community food chain.
- Give one way that non-native plants can cause problems for native plants and wildlife.

Objectives, Continued

- List two ways that humans impact native plants in the forest.
- Describe one benefit of planting native plants over non-native plants.
- Identify at least one plant and tell a traditional use of it by the Blackfeet, Salish, Pend d'Oreille or Kootenai.

MT State Science Standards

MT.SCI.K-12.3 Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

- A proficient student will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species.

Next Generation Science Standards

2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Background

One of the reasons Glacier National Park was established was to preserve the natural processes and the biological diversity (variety of plants and animals) that live here. This includes protecting old growth forests.

Sample Field Trip Schedule

Flexibility for weather conditions, bus problems, etc. is essential to having an enjoyable visit. No two school programs are exactly alike, but the following schedule represents a typical trip. If two classes visit at the same time we may modify the schedule.

8:30 a.m. – 9:30 a.m. Travel to the Park

Point out sights along the way that relate to the park story.

9:30 a.m. – 10:00 a.m. Drive to Avalanche Picnic Area to Meet Rangers.

10:00 a.m. – 10:15 a.m. Meet Park Rangers at Designated Site

After a welcome by park rangers to Glacier National Park, the group will talk about the National Park Mission and take a snack/bathroom break.

10:15– 12:00 p.m. Hike the “Trail of the Cedars”

Classes will be split into two groups and one ranger will go with each group. Rangers will stop along the trail to involve the students in short activities to learn about succession, photosynthesis, decomposition, seasonal changes, plant structures, soil formation, competition and other interrelationships in the forest.

12:00 p.m. – 12:30 p.m. - Lunch, Bathroom Breaks and Clean-Up

12:30 p.m. – 1:15 p.m. Components of National Parks.

Classes will consider the connection of people with this place for thousands of years, especially the Blackfeet, Kootenai, Salish and Pend d'Oreille. Students will participate in an activity called, “Create A National Park” where they will work in small groups to create their own special protected area for people to visit and learn in.

1:15 p.m.– 1:30 Bathroom Breaks and Conclusion

Ranger(s) engage all of the students in a fun activity to assess their learning.

1:30 p.m. – Bus Leaves the Park

Protecting the National Park

In order to have a fun and exciting experience, a firm framework of rules should be discussed in advance. The discussion should include the following points:

- Respect both plants and animals in Glacier National Park.
- Harassing animals and picking flowers, pine cones, feathers, and other natural objects in the park are illegal.
- Respecting rights of others in Glacier by refraining from disruptive behavior.
- Respecting each other, the ranger, chaperones, and teachers (walk on trails, keep hands to yourself, wait to talk until the instructor is finished, etc.)

School Regulations and Safety

Teachers are responsible for following school regulations regarding parental permission slips, travel authorization/insurance, etc. An accident can ruin a field trip and jeopardize future ones. Safety is of utmost importance. Students must be with adults at all times.



Clothing

Remind students to check the weather and bring appropriate, comfortable clothing, including a hat, rain pants, warm coat, gloves/mittens, and hiking shoes. Encourage students to bring extra layers.

Name tags

For safety and courtesy, rangers prefer to call students by name. Masking tape with names written in big letters, works well. If you make name tags as a pre-visit activity, be sure they are easy to read and stay on when the students are active.

Food and Lunches

Everyone needs a lunch and drink. Re-sealable drinks work best as they can be refilled and saved. No food or drink is available at the park. Students are expected to clean up the lunch area. Food/gum are prohibited except at designated times.

Groups

See the chaperone guidelines on the next page. Typically it works best to assign adults to groups of students before arriving at the park. (A typical bus of 45-4th grade students would be divided into nine groups of five students each.)

Items to leave Behind

Students should not bring iPods, CD players, radios, cell phones, or money. These items can be lost and may be a distraction. Adults should also leave cell phones at home (or turned off) during the field trip. Cameras and binoculars will not be needed and may only be brought if they will be used at ranger approved times. Designating one adult as the class photographer and asking them to take pictures throughout the day to share with everyone is a great alternative.

Safety

An accident can ruin a field trip and jeopardize future ones. Safety is of the utmost importance. Students should stay with adults at all times.

Chaperone Guidelines and Responsibilities

The chaperone requirements for ranger-led educational field trips to Glacier are (these numbers include the teacher):

- Kindergarten - 2nd Grade = 1 adult for every 3 students (example: 22 students, 8 adults required/allowed).
- 3rd - 5th grade = 1 adult for every 5 students (example: 22 students, 5 adults required/allowed)).
- 6th grade and higher = 1 adult for every 10 students (example: 22 students, 3 adults required/allowed).

Please assist your child's teacher by volunteering to help with a field trip to Glacier, or by respecting when your help is not needed because it exceeds the park's guidelines listed above. Our facilities, staffing, and resource protection mandate that we limit not only the number of students we can handle per trip, but also the number of adults with each group.

If you are selected to help with a field trip, realize that you are an important partner in our program. We need your participation and cooperation to make the trip a success and will be asking this of you:



- **Do not bring siblings who are not part of the class.** Your full attention is needed to help monitor the students assigned to you that day.
- **Please ride on the school bus.** It makes getting everyone through the entrance station much easier and avoids parking problems.
- **Assist with safety.** It will be one of your primary duties as a chaperone.
- **Be an active participant.** Students will want to participate if you do.
- Provide guidance to students for lunch and clean-up.
- Help set boundaries and provide leadership.
- Guide the learning process and help focus students on the activity or speaker.
- **Please consult with your school administrators about the policy regarding firearms on school sponsored events.** We have never had an injury from a wildlife encounter in over 20 years of conducting school field trips in Glacier. Rangers carry bear spray, first aid kits, and radios and will show the group how to hike and recreate safely while in the park.
- Most importantly go with the flow, adapt, and have fun in Glacier! The students pick up on how you react if you are having fun, they will too!

Sample Teacher Evaluation of Ranger and How Day Went



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE

Glacier National Park
West Glacier, Montana 59936

Thank you for bringing your students to Glacier National Park. Your candid and thoughtful responses to the questions below will be used to help us further improve our programs.

1. Please rate how enthusiastically the ranger engaged your students
 - Exceeded my expectations
 - Met my expectations
 - Did not meet my expectations
2. Please rate how respectfully the ranger engaged with you and your chaperones
 - Exceeded my expectations
 - Met my expectations
 - Did not meet my expectations
3. Please rate how appropriate the ranger's teaching techniques were for your students' grade level
 - Exceeded my expectations
 - Met my expectations
 - Did not meet my expectations
4. Please rate how well prepared the ranger was to teach and lead your class
 - Exceeded my expectations
 - Met my expectations
 - Did not meet my expectations
5. How well did the ranger attend to the safety of all participants?
 - Very well
 - Somewhat well
 - Not at all well
6. Please let us know what the ranger did well and what he/she can improve upon
7. Please rate how well the program activities met the curriculum learning objectives
 - Very well
 - Somewhat well
 - Not at all well
8. Please rate how appropriate the vocabulary and concepts were for your students' age level.
 - Very appropriate
 - Somewhat appropriate
 - Not appropriate
9. Please rate how much your students' understanding of concepts you are teaching in the classroom increased.
 - Exceeded my expectations
 - Met my expectations
 - Did not meet my expectations
10. Please let us know what content and activities worked well and what we can improve upon
11. How would you rate the ease of registering for the GNP program?
 - Very easy
 - Somewhat easy
 - Not easy
12. Please rate the usefulness of the pre-arrival resources you used by placing an "x" in the appropriate box.

	Essential	Useful, not essential	Not useful	Don't know/Didn't use
Pre-visit lessons				
Tips for a successful field trip				
Chaperone guidelines and responsibilities				
Meeting map				
Field trip logistics and timeline				
Learning objectives and alignment with state standards				
Pre-trip phone call with GNP ranger				
Post-visit lessons				
13. If you used pre- and/or post-visit lessons, please describe the ones which you found most useful.

Sample Ranger
Evaluation of Class
and How Day Went



United States Department of the Interior

NATIONAL PARK SERVICE
Glacier National Park
West Glacier, Montana 59936

Dear _____:

Thank you for participating in the education program at Glacier National Park on _____.

We hope that the field trip provided your class with an opportunity to better understand the significance of their national park. As a follow-up we are sending all participating teachers this evaluation to help you better prepare for your next trip. This evaluation is intended to point out strengths as well as areas that need additional attention.

Students wore name tags and were properly dressed for the day.	
Snacks/lunches were organized for easy distribution and everyone assisted with lunch clean-up.	
There were an appropriate number of chaperones present.	
Chaperone(s) actively participated in supervising students.	
Pre-site class preparation was evident.	
Class behavior facilitated a positive learning environment.	

Additional comments:

Sincerely,

Park Ranger(s)



Lesson 3: Post-Visit

Forest Poems

Materials:

- * Pencils
- * 5x7 index cards, one for each student
- * Laminated sheet with an example of a haiku and cinquain poem



Vocabulary

Cinquain, haiku.

Method

Students share their observations about the forest in a group activity, then go off by themselves and write a poem.

Objectives

Students will share highlights of their forest experience with their classmates
Students will express their observations and feelings about the forest in a poem.

MT Common Core Standards

MT.SCI.K-12.3.3 Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

- A proficient student will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species.

Next Generation Science Standard

2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

Background

The purpose of this activity is for students to experience nature as the inspiration for a poem, and to successfully write the poem.

Haiku, originated by the Japanese, consists of three lines of five, seven and five syllables each. The emphasis is syllabic, not rhyming.

For example:

The students explored
giant green pillars of life
dwarfed by their glory

Cinquain (sounds like “singkane”)

This is another form of poetry based on syllables and derived from the French and Spanish words for five. There are five lines, and each line has a purpose and number of syllables:

Background Continued

1. The title in two syllables (or two words)
2. A description of the title in four syllables (or words)
3. A description of action in six syllables (or words)
4. A description of a feeling in eight syllables (or words)
5. Another word for the title in two syllables (or words)

For example:

Hiking

Walking along

Breathing crisp, quiet, clean air

One with nature's wonderful ways

Sharing

Procedure

1. Ask the students to sit down in a circle. The first person begins by telling something they observed, felt, or did in the forest: "I saw a beetle boring into the wood of a fallen tree," or "I liked the fresh smell of pine needles in the forest." What was it like? What did it remind you of?
2. The next person does the same, and then repeats the statement of the first player. This continues all the way around the circle, until the last player is left to repeat the statements of everyone in the circle. Depending on the size of the class, you may want to divide into two or three circles, so that it is not impossible to repeat all player's statements.
3. Begin a discussion about poetry with the entire class, asking the students what a poem means to them. Students have a tendency to get "freaked-out" over the thought of writing a poem, thus the discussion can aid in breaking down a poem into the concept of a grouping of words designed to relate a vivid and imaginative sense of experience. Encourage the students to use an abundance of descriptive words. Their goal is to try to bring the experience of the forest alive through their creative use of words. Have them think how they would answer the questions: What was it like? What did it remind you of?
4. Give the students suggestions of the types of poems they might create: rhyming poems, a poem in the shape of a tree, a haiku or cinquain (have an example of these types of poems for the students).
5. Point out a large area with boundary marks, and instruct the students to find their own special spot, a spot they feel attracted to. Have them put their paper and pencil down, and for the first five minutes, sit absolutely still, letting the world around them go on as it does when they aren't there. Direct them to feel that they are a part of the natural surrounding; mentally move with the pine needles as the wind whizzes by, or hop along the forest floor with a robin searching for food. At your signal, they may begin their poem. Allow 10-20 minutes for poem writing, then call the students back for evaluation discussion.

Evaluation

Ask the students about their poem experience. "Does anyone want to share their poem?" (You may want to loosen up the group by sharing yours first!) "If you had to choose between two comfortable, safe places to live, one with and one without a forest, which would you choose? Why?"

Extension

Complete the role play activity [Up the Down Tree House](#) from our website.



Appendix

Additional Teacher Background Information

GLACIER PLANTS

Glacier National Park is home to at least 1,132 species of vascular plants (those containing vessels that conduct water and nutrients). There are 20 different tree species, 93 woody shrubs or vines, 88 annual or biennial plant species, and 804 types of perennial herbs. Included in these numbers are 127 non-native species. Besides vascular plants, the park also has at least 855 species of mosses and lichens. There are likely more than 200 species of fungi, but this group has not been as well-studied. Sixty-seven vascular and 42 non-vascular plant species found in Glacier Park are listed as “sensitive” by the State of Montana.

Glacier Park has 30 species that are “endemic” to the region, those with ranges limited exclusively to the northern Rocky Mountains. All but one of these occur in cold, open areas characteristic of harsh, post-glacial environments. Many are relics of the post-glacial age or occur here because the diverse combination of environmental conditions create unique micro-habitats. Three major North American watersheds arise from Glacier National Park (Arctic, Atlantic and Pacific). Two climate zones (Pacific Maritime and Prairie/Arctic) are separated by the Continental Divide. Biomes range from the lower elevation Pacific cedar-hemlock forest to the high alpine tundra. These life zones, separated along an altitudinal gradient, contain a range of biodiversity unmatched in the Northern Rockies.

Plant species in Glacier Park have affinities with four major floristic provinces: (1) Cordilleran [49%], including the southern and central Rocky Mountains as well as the Cascade Mountains of the Pacific Northwest; (2) Boreal [39%], similar to what one would find across Canada; (3) Arctic-Alpine [10%]; and (4) a few representatives from the Great Plains [1%].

Moist, temperate conditions on the west side of Glacier Park have allowed the eastern-most extension of Pacific cedar-hemlock forest to develop in the Lake McDonald Valley. Moisture from the Pacific coast condenses during its rise to the Continental Divide. Rainfall ranges from an average of 23 inches in the park’s driest locations along the northeast and northwest edges of the park to 30 inches at West Glacier. Precipitation in excess of 100 inches may fall in isolated cirques near the Continental Divide.

On the east side of the Park, dry chinook winds sculpt trees along the high ridges while calmer conditions prevail in the aspen groves below. The difference in rainfall is not extreme, but the desiccating winds have made the plant communities very different on the east side. The dark, ancient cedar/hemlock forests of the west side are a stark contrast to the more open forests, glades and grasslands of the east side. Plant varieties change somewhat north to south as well because the north half of the Park is in the rain shadow of the Whitefish Range. The cedar-hemlocks give way to drier Douglas fir and lodgepole pine forests in the North Fork, Flathead River drainage.

The Park’s plant cover is roughly 33% moist coniferous forest, 29% barren or sparsely vegetated rock/snow/ice, 16% dry coniferous forest, 8% dry meadow and prairie, 6% deciduous forest (primarily aspen and black cottonwood), 5% wet meadow or fen, and 3% lake surface water (with aquatic plants occurring in the shallower zones).

LIFE ZONES (HABITATS)

Grasslands

Also known as bunchgrass prairie, this grass association stretches in a narrow band from southern Alberta into Montana. In Glacier, the fescue grasslands are found on the southern slopes and valley bottoms of major drainages on the east side of the mountains. Due to the close relationship of the mountains with the grasslands, in some places prairie species have been found above tree limit in association with alpine species. Grasslands west of the divide exist as prairies nestled in the North Fork Valley. Historically, a short natural fire interval has swept through that valley, preserving native prairie species. More than a hundred species of grasses thrive in the drier, windblown areas of the park. Waterton Lakes National Park contains a 13-square-mile (34-sq.-km) area of prairie that is one of only two preserved within the Canadian national park system. [Note: Parks Canada information on life zones, or eco-regions, lists four and does not include grasslands as a separate zone. Their lowest classified zone is the Foothills Parkland Eco-region “with its associated grasslands and aspen forests.” In this discussion that zone is listed next as the Aspen Parkland.]

Aspen Parkland

This zone consists of a broad band of forest and groves, which stretches across parts of three Canadian provinces and south into Montana. This region serves as a transition belt between the grasslands and the coniferous forest zone. The dominant tree cover is quaking aspen along with black cottonwood. Aspen forests are common in the eastern half of Waterton Lakes but are primarily restricted to valley bottoms in Glacier National Park. Shrub wetlands and marsh habitats are common constituents of this region. The aspen parkland is the most important winter range for elk and deer.

Ten percent of Glacier (and Waterton’s) area is composed of foothills fescue-oatgrass-aspen parkland. Unlike cultivated grasses, native fescues retain much of their nutrient value through the winter. This is crucial for the large herds of elk wintering in the park. Frequent chinook winds also benefit ungulates, as the winds sweep snow from grassy areas. Winds also cause snow drifts on the lee side of hills and in sheltered gullies, creating a distributions pattern of trees and shrubs, shelter belts for animals during windy winter days.

Montane Forest

This zone occurs at low to mid-elevations in both parks but on the eastern slopes is largely restricted to the dry foothills and major river valleys. It is a mix of dry grasslands and relatively open mixed poplar and coniferous forests. Douglas fir, white spruce, and limber pine are distinctive trees of this zone. Lodgepole pine is found but is not a good indicator species as it extends up into the Subalpine. In areas of greater moisture west of the divide in Glacier, cedar-hemlock forest is at the eastern edge of its range. On drier sites with higher fire frequencies, ponderosa pines predominate. Shrubs associated with the Montane are bearberry and juniper. Twinflower, thimbleberry, and meadow rue grow on the forest floor.

Alpine Tundra

The word “tundra” comes from the Finnish tunturi meaning “a treeless plain.” Treeline occurs at about 6,900 feet (2100 m) on the west slope and 6000 feet (1800 m) on the east side. The alpine zone above that covers nearly one-quarter of Glacier and Waterton. This is the land above the trees. Expanses of bare rock make up much of this zone. The high country is a land of harsh conditions. Winds are often strong. The sun is intense, 5 percent brighter than at sea level with increased ultraviolet radiation. Plant leaves are often covered by tiny hairs, as an adaptation to diffuse light and prevent burning. Though there is ample rainfall, the winds neutralize much of it. Summers are short, temperatures low, soils shallow.

There is a profusion of miniature plants, a universal adaptation. Short stature protects life from the most whipping winds. It means less exposed surface, cutting evaporation. It spares energy that might be used for growing tall stalks and broad leaves and puts the energy into essentials: production by seed or vegetatively (through rhizomes, bulbs, tubers). Most plants are perennial and grow in cushions, mats, and low clumps. Many alpine plants cope with the short growing season by developing in stages: stems and leaves one year, buds the next, blossoms, and seeds the third year. In Waterton-Glacier, cushion plant communities, alpine meadows, and alpine bog areas are common. A number of mammals including the pika, marmot, and mountain goat have also adapted to this harshest of environments.

Subalpine Zone

With increased elevation, the dense forest zone gives way to widely-spaced islands of dwarfed trees and lush meadows. The subalpine forest is the single most extensive vegetation community in both Waterton and Glacier. It is a region characterized by heavy snowfall and a short growing season. A boreal element is present with dwarf birch and fireweed.

In Waterton, at around 5000 – 6000 feet (1500-1800 m), the lower subalpine is a dense forest of spruce and fir characterized by heavy snowpack. In the upper subalpine, firs provide shelter for each other against battering winds and frigid temperatures. Wind and ice can shear off the growing buds of a tree so that the branches only grow on the leeward side; this is called flagging, as the trees resemble flags unfurled. Trees often form krummholz vegetation, growing stunted and twisted on exposed slopes.

Whitebark pine can grow in the harshest of sites, creating a microhabitat suitable for subalpine fir, thus extending the elevation of treeline. The park's whitebark pine populations have nearly been decimated by white pine blister rust which was introduced from Europe in 1910. Other species include Englemann spruce and lodgepole pine.

Subalpine meadows are key habitat for bighorn sheep and seasonally for bears. The elusive wolverine inhabits this zone. Marmots, chipmunks and ground squirrels are commonly seen during summer months. Logan Pass is a good example of a well-traveled subalpine area.

Natural Processes and Baseline Studies

The components of local plant communities constantly change over time. Short-term natural disturbances (fires, avalanches, floods, windstorms) and long-term shifts in environmental conditions (climate, glaciation) continue to cause change. All parks have already been modified to some extent by human activities. A major challenge for ecosystem researchers and managers will be to distinguish between natural changes and human-caused changes. Glacier is unique in that, although there is human influence here, the area is relatively pristine and therefore offers a benchmark for baseline studies of such things as air quality, water quality, and wildlife in a relatively uncontrolled environment.

FIRE

Fire is a powerful force of nature. Ignited by lightning or by humans, fires fascinate and frighten us. When conditions are dry and windy a wildland fire can race through a forest, cross meadows and jump rivers. Or it can simply creep along in the undergrowth. Humans have used fire and tried to control it from the earliest times. While burned trees may look stark and dead, they are evidence of a natural process that helps maintain a healthy forest. In many ecosystems fire is essential for the continued survival of both the plants and animals that live there. While loss of homes, property or human life is a tragedy to be avoided, fire is a beneficial force necessary to ensure forest succession.

The summer of 2003 was one of the most significant fire season in the history of Glacier National Park.

After a normal winter snowpack, precipitation was below average from April through June (66% of normal), but more importantly, July, August, and early September brought almost no precipitation. This came on the heels of the 5th year of drought in northwest Montana. Approximately 136,000 acres burned within the park boundary, which was more than during the previous benchmark fire-year of 1910.

Seldom does everything burn within a fire perimeter. Some areas may be untouched by flames, while adjacent sections burn at a low to moderate severity. These areas will rejuvenate quickly. Other areas are fully engulfed, but will in time provide a vibrant habitat. The result is a dynamic blend of mixed severity burned and unburned forest called the forest mosaic.